WHAT IS CLAIMED IS:

1. A solid state imaging device, comprising:

a plurality of first channel regions of one conductive type arranged on a main surface of a semiconductor substrate of a reverse conductive type, the plurality of first channel regions being arranged in parallel to one another while being spaced apart at a predetermined distance;

a drain region formed in a space between the plurality of first channel regions;

a plurality of first transfer electrodes formed over the plurality of first channel regions and arranged in parallel to one another along a direction intersecting the first channel regions;

a second channel region of the one conductive type formed on the main surface of the semiconductor substrate of a reverse conductive type as a connected portion of the first channel regions, the second channel region extending along a direction intersecting the first channel regions; and

a plurality of second transfer electrodes formed over the second channel region and arranged in parallel to one another along a direction intersecting the second channel region; wherein

the second channel region has an impurity concentration lower than that of the first channel regions.

2. A solid state imaging device as defined in Claim 1, wherein a boundary between the first channel region and the second channel region is set in accordance with a boundary between the last row of the plurality of first transfer electrodes and the second transfer electrodes.

3. A method for manufacturing a solid state imaging device including an imaging section having a plurality of light-receiving pixels arranged in a matrix, a vertical transfer section having a plurality of vertical shift registers arranged corresponding to respective columns of the plurality of light-receiving pixels, a horizontal transfer section formed on an output side of the plurality of vertical shift registers, and an output section formed on an output side of the horizontal transfer section, the manufacturing method comprising:

a first step of forming a channel region by doping dopants of a reverse conductive type to a main surface of a semiconductor substrate of one conductive type;

a second step of forming a resist pattern covering a region corresponding to the horizontal transfer section and the output section on the main surface of the semiconductor substrate; and

a third step of doping dopants of the reverse conductive type to the main surface of the semiconductor substrate using the resist pattern as a mask; wherein

a channel region of the horizontal transfer section and the output section is formed to have an dopant concentration lower than that of a channel region of the imaging section and the vertical transfer section.

4. A method for manufacturing a solid state imaging device as defined in Claim 3, further comprising:

a fourth step of performing, after the second step, a step of forming a plurality of transfer electrodes on the main surface of the semiconductor substrate; and

doping dopants of the one conductive type to the semiconductor substrate through the plurality of transfer electrodes, so as to create an isolation region within the channel region.